"PATENT"

APPEAL BRIEF TRANSMITTAL FORM

In re application of: ChangMin Chun et al.
U.S. Serial No.: 10/002,576 [810.029]
Filed: October 26, 2001
For: REACTIVE HEAT TREATMENT TO FORM PEARLITE FROM AN IRON CONTAINING ARTICLE

) Before the Board of
) Patent Appeals and Interferences
) Examiner: Harry D. Wilkins III
)
) Confirmation Number: 4233
) Group Art Unit: 1742
) Family Number: P2001J062

Commissioner for Patents
Mail Stop Appeal Brief - Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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Jacqueline Wright	Jacqueline Wright	12/1/04
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Enclosed is the Appeal Brief in the above-noted application, in triplicate (send in triplicate even when faxing).

The item(s) check below are appropriate:

[X] $340.00 Fee for Appeal Brief.

[ ] Petition for extension of time pursuant to 37 CFR 1.136 and 1.137 is hereby made if, and to the extent, required. The fee for this extension of time is calculated to be $_____ to extend the time for filing this paper until _____.

[X] Total Fee $ 340.00.

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[X] The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 and 1.17 which may be required by this paper, or credit any overpayment to Deposit Account No. 05-1330. A duplicate copy of this Form is enclosed.

Nov. 30 2004 — Linda M. Scuorzo

DATE OF SIGNATURE — ATTORNEY OR AGENT OF RECORD

Post Office Address (to which correspondence is to be sent):
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"PATENT"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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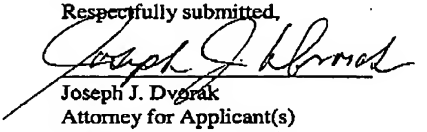
Sir:

In response to the Office Letter of November 23, 2004 appellants are enclosing a new Appeal Brief.

Respectfully submitted,



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[X] Pursuant to 37 CFR 1.34(a)

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JJD:jdw (11/30/04)

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PATENT TRADEMARK OFFICE

"PATENT"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Sir:

Appeal Brief Under 37 CFR 1.92

Real Party In Interest

The invention which is the subject of this appeal is assigned to ExxonMobil Research and Engineering Company.

Related Appeals and Interferences

There are no other appeals or interferences which will directly affect or be affected by or have a bearing on the Board's decision in this appeal.

CERTIFICATION OF FACSIMILE TRANSMISSION
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Jacqueline Wright — Type or print name of person signing certification
Jacqueline Wright — Signature
12/1/04 — Date

Status of the Claims

The application was filed with 8 claims and 3 new claims were added during prosecution; however 4 claims had been cancelled. As a result claims 1, 2, 6, 7, 10 and 11 are still pending.

Claims 1, 2, 7 and 10 stand rejected by the Examiner under 35 USC 103(a) as unpatentable over Ramanarayanan (US 5,869,195) in view of Garg (US 6,287,393) and Hemsath (US 5,997,286). Claims 6 and 11 were rejected based on the foregoing patents in further view of Kerridge (US 4,461,655). The rejection of all these claims is appealed.

Status of Amendments

On July 13, 2004 appellants submitted an amendment in response to the final rejection of May 25, 2004. The amendment, however, was not entered on the asserted grounds that it did not place the case in condition for allowance.

Summary of the Claimed Subject Matter

The invention set forth in independent claim 1 is concerned with producing a continuous pearlite structure from an iron containing article (paragraph [0009] bridging pages 2 and 3) which will provide corrosion protection (page 4, line 2). The iron containing article has less than 0.77 wt% carbon and at least 50 wt% iron. (Para. [0022]) The article is heated for a time and at a temperature sufficient to convert at least a portion of the article to an austenitic structure. ([0009]) Next the article is exposed to a carbon supersaturated environment at 727°C to 900°C to diffuse carbon into the austenitic structure. A carbon supersaturated environment is defined as having a thermodynamic activity of carbon greater than 1. (Para. [0010]) Typical CO/H_2 environments contain 10 to 60 vol% H_2 (Para. [0011]). Then the article is cooled resulting in formation of a continuous pearlite structure (Para. [0009]).

Grounds of Rejection to be Reviewed

Whether the Examiner improperly rejected claims 1, 6, 7, 10 and 11 under 35 USC 103(a).

Argument

(1) Ramanarayanan in view of Garg and Hemsath fail to render claims 1, 2, 7 and 10 obvious.

Ramanarayanan is concerned with protecting refinery steels against corrosion by forming an iron sulfide film on the surface of the steel provided the surface has a pearlitic microstructure. (Abstract) Ramanarayanan teaches forming a pearlite structure by heating a conventional ferritic-pearlitic steel containing at least 0.7 wt% carbon above 900°C and then at about 675°C where pearlite transformation takes place (col. 2, lines 55 to 60). Alternatively heating in a carburizing atmosphere at a temperature above 900°C is taught (col. 3, lines 1 to 5). Ramanarayanan does not disclose or suggest heating to form an austenitic structure and then heating at 727°C to 900°C in a carbon atmosphere followed by cooling as required by appellants' claims. Indeed appellants show in their Figure 4 that carburization of austenite at temperatures above 900°C does not result in a continuous pearlite structure.

Garg is concerned primarily with producing atmospheres that are suitable for carburizing carbon steel articles (col. 3, lines 56 to 58). Garg does disclose carburizing metal articles by heating them to a temperature of from 800°C to 950°C under a carburizing atmosphere (col. 4, lines 48 to 64). Garg does not disclose or suggest heating the article to the austenitic range before carburization as required by appellants' claimed method.

The Examiner contends that it would be obvious to use the temperature range of Garg in the process of Ramanarayanan. Such, however, is not the case. Quite clearly there is absolutely no motivation for using the Garg temperature range in the process of

Ramanarayanan because Ramanarayanan states that conventional steels are converted to pearlite structure by heating above 900°C and then at 675°C (col. 2, lines 55 to 60) or alternatively by heating in a carburizing atmosphere at a temperature above 900°C (col. 31, lines 1 to 5).

Hemsath is cited as teaching a preheating zone prior to carburizing a metal. The preheating, however, is conducted in an oxidizing atmosphere for the purpose of decoiling the metal article (col. 6, lines 56 to 60). Thus, Hemsath does not suggest heating an iron article having less than 0.77 wt% carbon to convert the ferrite structure to an austenitic structure, followed by carburization at 727°C to 900°C. (Claim 1) That teaching comes solely from appellants' specification and claims.

(2) Ramanarayanan in view of Garg, Hemsath and Kerridge fail to render claims 6 and 11 obvious.

Appellants' dependent claim 6 is drawn to the process of claim 1 wherein the time for diffusion is from about 1 minute to 50 hours. (Para. [0018]). Appellants' dependent claim 11 adds the limitation that the pearlite structure has the thickness of the iron particle treated (Para. [0018]). For the third reference, Kerridge, in the Examiner's string of references appellants' contend that Kerridge must add some disclosure that serves to overcome the deficiencies of the primary references. The deficiencies of the primary references have already been set forth in section (1) above. Kerridge adds no disclosure that relates in any way to the limitations set forth in claim 1.

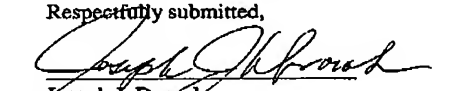
Kerridge is concerned generally with the carburization of metals in a fused salt bath where the fused salt is the source of the carburization species (col. 1, lines 15 to 17). Kerridge is cited as teaching that treatment time in his process affects depth of treatment. But this has nothing to do with carburization of metals in gaseous atmospheres such as those disclosed in Ramanarayanan or Garg, for example, or with the carbon supersaturated atmosphere of appellants used in treating an iron article

converted to an austenitic structure (claim 1). Indeed Kerridge fails to offer anything that overcomes the deficiencies of the primary references already discussed above.

Conclusion

In view of the foregoing, appellants submit that their claims are patentable over the cited art and they respectfully request the Board to reverse the Examiner's rejections.

Respectfully submitted,



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Appendix

1. A process for producing pearlite from an iron containing article having less than 0.77 wt% carbon comprising the steps of, (a) heating an iron containing article comprising at least 50 wt% iron and in which the amount of carbon contained in the article is less than 0.77 wt% down to 0.0 wt% carbon for a time and at a temperature sufficient to convert at least a portion of said article from a ferritic structure to an austenitic structure, (b) exposing said austenitic structure, for a time sufficient and at a temperature of about 727 to about 900°C, to a carbon supersaturated CO/H_2 environment consisting essentially of CO and 10 to 50 vol.% H_2, and having a carbon activity greater than about 1, to diffuse carbon into said austenitic structure and (c) cooling said iron containing article to form a continuous pearlite structure.

2. The process of claim 1 wherein said iron containing article further comprises silicon, manganese, and mixtures thereof.

6. The process of claim 1 wherein said time sufficient to diffuse carbon into the austenitic structure ranges from about 1 minute to about 50 hours.

7. The process of claim 6 wherein said pearlite structure is a continuous layer having thickness of at least about 10 microns.

10. The process of claim 7 wherein the layer is from about 10 microns to about 1000 microns.

11. The process of claim 6 wherein the pearlite structure has a thickness equal to the iron article.